

Amendments to the Claims:

1. (Previously Presented) A system for cooling a fiber amplifier, the system comprising:

a fiber amplifier assembly comprising:

a longitudinally-extending fiber amplifier, the fiber amplifier including a core and a cladding;

a longitudinally-extending jacket having a single substantially centrally-located passage within which the fiber amplifier, including the core and the cladding, is disposed such that the fiber amplifier assembly defines a passage between the jacket and the fiber amplifier, including the core and the cladding, for the circulation of coolant therethrough; and

a retaining structure disposed within the passage defined by the fiber amplifier assembly for at least partially maintaining a spacing between the fiber amplifier and jacket, wherein the retaining structure and coolant comprise an emulsion of phase change material.

2. (Original) A system according to Claim 1 further comprising:

a thermal management system capable of circulating coolant through the passage defined between the jacket and fiber amplifier of the fiber amplifier assembly.

3. (Original) A system according to Claim 2, wherein the thermal management system is capable of placing coolant in thermal communication with the fiber amplifier such that the coolant is capable of carrying heat away from the fiber amplifier, and wherein the thermal management system is capable of rejecting the heat carried away by the coolant.

4. (Original) A system according to Claim 3, wherein the thermal management system is capable of placing coolant in thermal communication with the fiber amplifier such that the coolant is capable of at least partially melting to thereby carry heat away from the fiber amplifier, and wherein the thermal management system is capable of condensing at least a portion of the at least partially melted coolant to thereby reject the heat carried away by the coolant.

5. (Original) A system according to Claim 1, wherein the fiber amplifier assembly defines a passage between the jacket and the fiber amplifier for the circulation of coolant selected to have a refractive index smaller than a refractive index of the fiber amplifier.

6. (Original) A system according to Claim 1, wherein the emulsion of phase change material comprises a plurality of phase change materials suspended in a carrier fluid, wherein each phase change material comprises an encapsulated composition.

7. (Previously Presented) A system for cooling a fiber amplifier, the system comprising:

a fiber amplifier assembly comprising:

a longitudinally-extending fiber amplifier, the fiber amplifier including a core and a cladding;

a jacket surrounding the fiber amplifier, including the core and the cladding, and extending at least partially longitudinally therewith, wherein the jacket surrounds the fiber amplifier such that the fiber amplifier assembly defines a passage between the jacket and the fiber amplifier, including the core and the cladding, for the circulation of coolant therethrough; and

a retaining structure disposed within the passage defined by the fiber amplifier assembly for at least partially maintaining a spacing between the fiber amplifier and jacket, wherein the retaining structure and coolant comprise an emulsion of phase change material,

wherein the emulsion of phase change material comprises a plurality of phase change materials suspended in a carrier fluid, wherein each phase change material comprises an encapsulated composition, and wherein the phase change materials are positioned within the passage such that the phase change materials remain at least partially stationary.

8. (Original) A system according to Claim 7, wherein the fiber amplifier assembly defines a passage between the jacket and the fiber amplifier such that the phase change materials remain at least partially stationary and the carrier fluid circulates through the passage.

Claims 9 – 24 (Cancelled).

25. (New) A method of cooling a fiber amplifier using the system of Claim 1, the method comprising:

circulating coolant through the passage defined between the jacket and the fiber amplifier such that the coolant is capable of carrying heat away from the fiber amplifier.

26. (New) A method according to Claim 25, wherein circulating coolant comprises:  
placing coolant in thermal communication with the fiber amplifier such that the coolant is capable of carrying heat away from the fiber amplifier; and  
rejecting the heat carried away by the coolant.

27. (New) A method according to Claim 26, wherein placing coolant in thermal communication with the fiber amplifier comprises placing coolant in thermal communication with the fiber amplifier such that the coolant at least partially melts, and

wherein rejecting the heat carried away by the coolant comprises condensing at least a portion of the at least partially melted coolant.

28. (New) A method according to Claim 25, wherein circulating coolant comprises circulating coolant selected to have a refractive index smaller than a refractive index of the fiber amplifier.